APPENDIX 1 - ON-ROAD HEAVY-DUTY VEHICLES

Below is additional information pertaining to the On-Road Heavy-Duty Vehicle (HDV) category under AQMD's FY 2006 Carl Moyer Program (CMP). All information in RFP# P2006-15 and this Appendix apply. For additional detail regarding this program category, refer to CARB's 2005 CMP Guidelines. In the case of any conflict between CARB guidelines and AQMD criteria, the more stringent criteria will prevail.

Applicants are further cautioned that CARB recently adopted Fleet Rules for refuse haulers, transit bus fleets and public fleets. Depending on the status of a regulated entity's fleet rule compliance, these vehicles may no longer be eligible for Moyer Program funding. Projects for applicants subject to the ARB Fleet Rules will be evaluated on a case-by-case basis to determine if there are any surplus emissions that remain eligible for Moyer Program incentives. Special data submittal requirements apply and are indicated in Attachment 1 of the Application Forms.

It is the Applicant's responsibility to check with AQMD's CMP web page for program clarifications, changes and updates. This page may be accessed by clicking the link on AQMD's home page at http://www.aqmd.gov/tao/implementation/carl_moyer_program_2001.html.

CARB MOYER PROGRAM RESOURCES

Applicants are highly encouraged to review CARB guidelines for additional requirements of the CMP. CARB guidelines are incorporated into AQMD's Moyer Program by reference. 2005 CARB guidelines may be downloaded from:

http://www.arb.ca.gov/msprog/moyer/guidelines/revisions05.htm

On this web page, there are links to the four parts of the CARB 2005 CMP guidelines. These parts are described below for easy reference.

- Part I provides the Executive Summary, Program Overview and Administrative Requirements primarily applicable to air districts) for CARB's Carl Moyer Program. The link to Part I is http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part1.pdf

- Part II provides the Project Criteria for each program category. The link to Part II is http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part2.pdf

- Part III provides the Agricultural Assistance Program guidelines. Link to Part III at http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part3.pdf

- Part IV is the Appendices section of the guidelines. The link to Part IV is http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part4.pdf . This section includes the following Appendices.

    - Appendix A – Acronyms
    - Appendix B – Tables for Emission Reduction and Cost-Effectiveness Calculations
    - Appendix C – Cost-Effectiveness Calculation Methodology
    - Appendix D – Example Calculations
    - Appendix E – Description of Certification and Verification Executive Orders
    - Appendix F – Retrofit Emission Control Strategies
    - Appendix G – Description of Functional Equivalency of Non-Original Equipment Manufacturer Repowers and Rebuilt Engines for use in Repowers

HIGHLIGHTS FOR 2006

- The project cost-effectiveness limit is $14,300 per weighed ton of NOx, PM and ROG emissions reduced. A four (4) percent capital recovery factor is used for the cost-effectiveness calculation.

- Cost-effectiveness calculations will now be based on particulate matter (PM10), oxides of nitrogen (NOx), and reactive organic gases (ROG). The new formula established by CARB is provided below. AQMD staff will calculate the NOx, PM and ROG emissions reductions and apply the new formula during the evaluation process.

$$\frac{\text{Annualized Cost (\$/year)}}{\text{NOx reductions + 20(combustion PM10 reductions) + ROG reductions (tons/year)}}$$

- Applicants **must** provide vendor quotes with their application to document the incremental cost of implementing the proposed technology. This will require documentation of both the baseline and low-emission project costs. Applicants can

request funding up to the full differential cost between an optionally certified low-emission vehicle/engine/equipment and its new base standard emission equivalent; however, less may actually be awarded, depending on the results of the cost-effectiveness evaluation.

- Applicants **must** also provide documentation that justifies the activity level projected for the vehicles (i.e., mileage logs, hour-meter records, business records, fuel receipts, etc.). Stop-and-go vehicle projects (i.e., refuse, street sweeper) that utilize a fuel-based calculation must provide fuel receipts for the past two years to justify the fuel consumption activity projected for the vehicle.

- All projects must be operational within twelve (12) months of contract execution.

- The new engine/equipment/vehicle must not have been purchased prior to the effective date of the contract.

- AQMD will conduct pre- and post-project inspections as described in the "Highlights for 2006" section of RFP#2006-15. Additional reporting and monitoring requirements are discussed below.

- Particulate filters and diesel oxidation catalysts are eligible for funding. These diesel emission control system (DECS) retrofit devices must be verified by CARB. Further, in order to include NOx emission reductions in the cost-effectiveness evaluation, the technology must be verified to reduce NOx emissions by at least 15 percent compared to the original engine certification level.

- AQMD reserves the right to disqualify any application that does not comply with all applicable requirements including submission of a complete application package. For On-Road Equipment projects, this includes the main application as well as the information requested in Attachment 2 to the application.

-

- AQMD funds only alternative fuel projects for new purchases and repowers of on-road heavy duty vehicles. No *new* diesel fueled vehicle/engine projects are eligible for CMP on-road funding under the AQMD's Moyer Program. As indicated earlier, diesel engine *retrofits* with CARB-verified systems are eligible for program funding.

- However, retrofit of existing diesel fueled on-road heavy-duty vehicles is an eligible project category. The AQMD Moyer Program will fund the cost of purchase and installation of a CARB-verified diesel emission control device, not exceeding the Carl Moyer Program cost-effectiveness limit. For retrofit projects that only take credit for NOx reductions from a Level 3 DECS (because the PM10 reductions are already required by regulation), the baseline cost is 1/2 the proposed project cost. The maximum funding for such projects would be the retrofit cost minus the default cost.

- The cost of the retrofit, and all filters needed during the project life, may be paid for with Carl Moyer Program funding provided it meets the weighted cost-effectiveness limit.

- Part One of Attachment 1 of the AQMD Application Form requires that **all** repower and retrofit projects provide the vehicle identification numbers (VINs) for the project vehicles in both hard copy and electronic format. This information will be provided to ARB for an ARB Violation Compliance Check. Any outstanding violations for a project vehicle must be resolved in advance of contract execution.

- Part Two of Attachment 1 of the AQMD Application Form requires that **all** applicants subject to an ARB Fleet Rule (i.e., transit bus, solid waste collection vehicle, public fleets, etc.) must provide the information requested therein. The application will not be considered until ARB evaluates this information and indicates to the district that the proposed project is indeed surplus to the regulation. The applicant is free to submit this information in advance of the application due date; AQMD will facilitate early ARB review of this information in order to determine program eligibility in advance of application preparation. A letter from CARB indicating the applicant is in compliance with applicable fleet rule(s), that also indicates the eligibility terms for the proposed project is acceptable, in lieu of the information required in Attachment 1, Part Two.

- Average Banking and Trading (ABT) engines (i.e., all Family Emission Limit (FEL)-certified engines) are not eligible to participate in the Carl Moyer Program for new vehicle purchase projects since emission benefits from an engine certified to an FEL level are not surplus emissions.

- Pre- and Post-Inspection of all vehicles/engines approved for funding is required as well as verification of engine destruction. Pre-Inspection will be conducted by the AQMD staff during the interim period between award of funding by the Governing Board and contraction execution. Post-Inspection and verification of the destruction of the engine being replaced will occur once all work on vehicles is completed.

- See Section III – Project Types, and Section IV – Project Criteria for additional important information regarding CMP requirements.

- Please review CARB's CMP Guidelines, Part IV, Appendix E for a comprehensive description of certification Executive Orders for new engines and Verification Letters for retrofit devices.

EVALUATION METHODOLOGY

AQMD staff will evaluate all submitted proposals and make recommendations to the Governing Board for final selection of project(s) to be funded. Proposals will be evaluated based on the cost-effectiveness of emissions (NOx + ROG + 20*PM) reduced on an equipment-by-equipment basis, as well as a project's "disproportionate impact"

evaluation (discussed below). Be aware of the possibility that due to program priorities and/or funding limitations, project applicants may be offered only partial funding, and not all proposals that meet minimum cost-effectiveness criteria may be funded.

In compliance with AB 1390, Firebaugh, the FY 2006 CMP requires that at least 50 percent of the funds be spent in areas that are disproportionately impacted by air pollution. CARB has issued broad goals and left the details of how to implement this requirement to each air agency. In the South Coast Air Quality Management District, the disproportionately impacted areas are defined by a weighted formula that includes poverty level, particulate matter (PM) exposure and toxic exposure. The process is described below:

1. All projects must qualify for the CMP by meeting the cost-effectiveness limits established in the RFP.

2. All projects will be evaluated according to the following criteria to qualify for Disproportionate Impact funding:

    a. Poverty Level: All projects in areas where at least 10 percent of the population falls below the Federal poverty level based on the year 2000 census data, will be eligible to be included in this category, and

    b. PM Exposure: All projects in areas with the highest 15 percent of PM concentration will be eligible to be ranked in this category. The highest 15 percent of PM concentration is 46 micrograms per cubic meter and above, on an annual average, or

    c. Toxic Exposure: All projects listed in the Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES II) report[1] as having a cancer risk of 1,000 in a million and above will be eligible to be ranked in this category.

    Data for the poverty level and PM and toxic exposures were obtained from the U.S. Census, the 1998 AQMD monitoring data and Mates II study respectively.

3. Fifty percent of the $30.1 million available for this RFP will be allocated among proposals located in disproportionately impacted areas. If the funding for disproportionately impacted areas is not exhausted with the outlined methodology, then staff will return to the Governing Board for direction. If funding requests exceed 50 percent of the total available funding, then all qualified projects will be ranked based on their disproportionate impact. Each project will be assigned a score that is comprised of 40 percent for poverty level, and 30 percent each for PM and toxic exposures. Proposals with the highest scores will receive funding until 50 percent of the total funding is allocated.

[1] Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES II), SCAQMD, March 2000.

All the proposals not awarded under the fifty percent disproportionate impact funding analysis will then be ranked according to cost-effectiveness, with the most cost-effective project funded first and then in descending order for each funding category until the remainder of the Moyer Funds are exhausted. Some projects that exceed the cost-effectiveness ceiling may receive partial funding, depending on their rankings.

Eligible Costs

Eligible project costs (i.e., costs for which Moyer funding is requested) are limited to the incremental cost of a project to implement the reduced emission technology. Operation and maintenance costs are not eligible for CMP funding. Please refer to the Project Types section below for additional detail.

Project Life

As discussed above, a key parameter in the determination of a project's emission reduction benefit is its project life. The acceptable maximum life for calculating the project benefits of on-road vehicle projects is summarized below in Table 1.1. Applicants must provide documentation to justify a longer project life.

Table 1.1 – Maximum Project Life for On-Road Vehicle Projects

Vehicle Type	Maximum Life without Documentation
School buses > 33,000 GVWR – New	20 years
Buses > 33,000 GVWR - New	12 years
Other On-road - New	10 years
Repowers with Retrofits	5 years
Retrofits	5 years

Reporting and Monitoring

All participants in the CMP are required to keep appropriate records during the full contract period. Records must be retained and updated throughout the project life and made available for AQMD inspection. Project life is the number of years used to determine the cost-effectiveness and is equivalent to the contract life. All equipment must operate in the AQMD for this full project life. The AQMD shall conduct periodic reviews of each project's operating records to ensure that the engine is operated as stated in the program application. Annual records must contain, at a minimum:

- Total miles traveled
- Total miles traveled in the South Coast Air Basin
- Annual fuel consumed
- Annual maintenance and repair information

Records must be retained and updated throughout the project life and made available for AQMD inspection. The AQMD may conduct periodic reviews of each vehicle/equipment project's operating records to ensure that the vehicle is operated as required by the project requirements.

Cost-Effectiveness Evaluation Discussion

Cost-effectiveness calculations are based on particulate matter (PM10), oxides of nitrogen (NOx), and reactive organic gases (ROG). The new formula established by CARB is highlighted above. AQMD staff will calculate the NOx, PM and ROG emissions reductions and apply the new formula during the evaluation process. Only CMP funds are to be used in determining cost-effectiveness[2]. The one-time incentive grant amount is to be amortized over the project life (which is also the contract term) at a discount rate of 4 percent. The amortization formula (given below) yields a capital recovery factor (CRF), which, when multiplied by the initial capital cost, gives the annual cost of a project over its project term.

$$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where

i = discount rate (4 percent)
n = project life (at least 3 years)

Table 1.2 lists the CRF for different project lives using a discount rate of 4 percent. Cost-effectiveness is determined by dividing the annualized costs of a project by the annual weighted emission reductions offered by the project.

[2] Unless the AQMD "buys down" the cost of the project by adding additional funding, in which case the total grant funding amount should be used for the cost-effectiveness calculation.

Table 1.2 – Capital Recovery Factors (CRF) for Various Project Lives At 4 Percent Discount Rate

Project Life	CRF
3	0.360
4	0.275
5	0.225
6	0.191
7	0.167
8	0.149
9	0.134
10	0.123
11	0.114
12	0.107
13	0.100
14	0.095
15	0.090
16	0.086
17	0.082
18	0.079
19	0.076
20	0.074

Executive Order Interpretation

CARB certifies engines destined for sale in California and provides the engine manufacturers with an Executive Order (EO) for each certified engine family. An example of an EO is shown in Figure 1.1. The EO includes general information about the certified engine such as engine family, displacement, horsepower rating(s), intended service class, and emission control systems. It also shows the applicable certification emission standards as well as the average emission levels measured during the actual certification test procedure. **For the purpose of the CMP, only the "Direct" emission standards are used in calculating emission benefits.**

The certification emission standards are shown in the row titled "(DIRECT) STD" under the respective "FTP" column headings for each pollutant. For instance, the Cummins 8.3 liter NG engine illustrated in Figure 1.1 was certified to a NOx+NMHC emission standard of 1.8 g/bhp-hr, a CO emission standard of 15.5 g/bhp-hr, and a PM emission standard of 0.03 g/bhp-hr.

In the case where an EO shows emission values in the rows labeled "AVERAGE STD" and/or "FEL", the engine is certified for participation in an AB&T program. AB&T engines (i.e., all FEL-certified engines) are not eligible to participate in the CMP for new vehicle purchase projects since emission benefits from an engine certified to an FEL level are not surplus. FEL-certified engine projects may participate in repower projects as discussed above.

Figure 1.1 – Sample Executive Order

California Environmental Protection Agency AIR RESOURCES BOARD	CUMMINS INC.	EXECUTIVE ORDER A-021-0340 New On-Road Heavy-Duty Engines

Pursuant to the authority vested in the Air Resources Board (ARB) by Health and Safety Code (HSC) Division 26 Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by HSC Sections 39515 and 39516 and Executive Order (EO) G-02-003; and

Pursuant to the December 15, 1998 Settlement Agreement (SA) between ARB and the manufacturer, and any modifications thereof to the Settlement Agreement;

IT IS ORDERED AND RESOLVED: That the engine and emission control systems produced by the manufacturer are certified as described below for use in on-road motor vehicles with a manufacturer's GVWR over 14,000 pounds. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	ENGINE SIZE (liter)	FUEL TYPE (CNG/LNG=compressed/liquefied natural gas; LPG=liquefied petroleum gas)	STANDARDS & TEST PROCEDURE	INTENDED SERVICE CLASS (L/M/H HDD=light/medium/heavy heavy-duty [HD] diesel; UB=urban bus; HDO=HD Otto)
2003	3CEXH0505CBK	8.3	CNG / LNG	Diesel	UB

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	ENGINE MODELS / CODES (rated power in horsepower, hp)
TBI, OC, HO2S, TC, CAC, PCM	CG-280 / 8012 (280 hp), CG-275 / 8009 (275 hp), CG-250 / 8006 (250 hp), CG-250 / 8003 (250 hp)

GVWR=gross vehicle weight rating TWC/OC=three-way/oxidizing catalyst WU (prefix) =warm-up cat. O2S=oxygen sensor HO2S=heated O2S TBI=throttle body fuel injection MFI=multi port fuel injection SFI=sequentialMFI DDI/DI=direct /indirect diesel injection TC/SC=turbo/super charger CAC=charge air cooler EGR=exhaust gas recirculation AIR=secondary air injection PAIR=pulsed AIR SPL=smoke puff limiter ECM/PCM=engine /powertrain control module EM=engine modification 2 (prefix)=parallel (2) (suffix)=in series HC=hydrocarbon NMHC=non-methane HC NOx=oxides of nitrogen CO=carbon monoxide PM=particulate matter HCHO=formaldehyde g/bhp-hr=grams per brake horsepower-hour

The following are the exhaust emission standards (STD), or family emission limit(s) (FEL) as applicable, and certification levels (CERT) for this engine family under the "Federal Test Procedure" (FTP) (Title 13, California Code of Regulations, (13 CCR) Section 1956.1 (urban bus) or 1956.8 (other than urban bus)), and under the "Euro III Test Procedure" (EURO) in the Settlement Agreement, including EURO's "Not-to-Exceed" standard(s). "Diesel" CO certification compliance may have been demonstrated pursuant to Code of Federal Regulations, Title 40, Part 86, Subpart A, Section 86.091-23(c)(2)(i) in lieu of testing. (For flexible- and dual-fueled engines, the CERT values in brackets [ ] are those when tested on conventional test fuel. For multi-fueled engines, the STD and CERT values for default operation permitted in 13 CCR Section 1956.1 or 1956.8 are in parentheses.)

	EURO'S NOT-TO-EXCEED STD						NMHC: *		NOx: *		NMHC+NOx: 2.25		PM: 0.0375	
* = not applicable	HC		NMHC		NOx		NMHC+NOx		CO		PM		HCHO	
	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO
(DIRECT) STD	*	*	*	*	*	*	1.8	1.8	15.5	15.5	0.03	0.03	*	*
AVERAGE STD	*	*	*	*	*	*	*	*	*	*	*	*	*	*
FEL	*	*	*	*	*	*	*	*	*	*	*	*	*	*
CERT	*	*	*	*	*	*	1.7	1.4	2.0	1.3	0.01	0.005	*	*

BE IT FURTHER RESOLVED: That certification to the FEL(s) listed above, as applicable, is subject to the following terms, limitations and conditions. The FEL(s) is the emission level declared by the manufacturer and serves in lieu of an emission standard for certification purposes in any averaging, banking, or trading (ABT) programs. It will be used for determining compliance of any engine in this family and compliance with such ABT programs.

BE IT FURTHER RESOLVED: That the listed engine models have been certified to the FTP optional NOx, or NMHC+NOx as applicable, and PM emission standard(s) listed above pursuant to 13 CCR Section 1956.1 or 1956.8.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the materials to demonstrate certification compliance with 13 CCR Sections 1965 (emission control labels), and 2035 et seq. (emission control warranty).

BE IT FURTHER RESOLVED: That the listed engine models are conditionally certified subject to the following conditions: (**1**) The SA is in effect; (**2**) The manufacturer is in compliance with all applicable California emission regulations, and all SA's applicable requirements and any modifications thereof; (**3**) This EO is void with respect to any engine within this family determined to have a defeat device as that term is defined in the test procedures and SA. Any engine produced under the voided EO remains subject to stipulated penalties under the SA. Such penalties would begin to accrue upon manufacture of the first engine under this EO; (**4**) This EO expires at midnight on December 31, 2002; (**5**) Production of any engine within this family under this EO is acceptance of all conditions in this EO; and (**6**) ARB reserves the right to disapprove certification of this family, or any families using the same or similar auxiliary emission control device (AECD) strategies as this family is employing, based on all available information.

The Bureau of Automotive Repair will be notified by copy of this Executive Order.
Executed at El Monte, California on this 28th day of October 2002.

Allen Lyons, Chief
Mobile Source Operations Division

Below are excerpts from CARB's CMP Guidelines pertinent to the AQMD RFP.

I. Introduction

On-road HDVs encompass a large variety of vehicles such as buses, solid waste collection vehicles, street sweepers, delivery trucks and more. These vehicles are typically categorized by weight. Vehicles greater than 8,501 pounds (lbs) gross vehicle weight rating (GVWR) are considered to be HDVs which can also be subcategorized as light heavy duty (LHD), medium heavy-duty (MHD) and heavy heavy-duty (HHD) vehicles (see Table 1.3).

Table 1.3
Heavy-Duty Vehicle Classifications

Vehicle Classification	GVWR
Light Heavy-Duty (LHD)	8,501 < 14,000 lbs
Medium Heavy-Duty (MHD)	14,001 < 33,000 lbs
Heavy Heavy-Duty (HHD)	33,001 or more lbs

HDVs can also be further categorized by use and fuel type. Regulations traditionally refer to the vehicle usage type such as solid waste collection vehicles (SWCV), urban buses, and street sweepers. Section III of this chapter provides information on regulations that currently impact these vehicles.

II. Regulatory Requirements

All HDVs sold in California have engines that have been certified to specific standards. Those standards are, in general, consistent nationwide and are discussed below. Urban transit buses are an exception, having more stringent requirements than other HDVs. All new purchases funded by the Carl Moyer Program must be surplus to these minimum requirements.

In addition, the ARB has developed, or is in the process of developing, additional regulations which will overlay these new engine standards for specific categories. These categories, discussed below, include transit vehicles, solid waste collection vehicles, school bus, public fleets and private fleets. Any Carl Moyer Program project must be surplus to these regulations.

A. Fleet Regulation for Transit Agencies

1. Transit Fleet Vehicles

The fleet regulation for transit agencies was amended by the Board on February 24, 2005 [ARB, 2005]. This regulation impacts vehicles owned or operated by a transit agency. The specific transit fleet vehicles impacted are on-road vehicles 8,501 pounds GVWR or greater powered by a heavy-duty engine fueled by diesel or alternative fuel

that are not urban buses. Transit agencies operating only gasoline-powered vehicles are not subject to this regulation.

The regulation establishes a fleet average NOx standard and PM emission reduction requirement for transit fleet vehicles phased-in between 2007 and 2010. Transit fleet vehicles are subject to the heavy-duty diesel engine emission standards and not the urban bus engine exhaust emission standards.

A transit agency must meet NOx emission averages of 3.2 g/bhp-hr by December 31, 2007, and 2.5 g/bhp-hr by December 31, 2010, from its transit fleet vehicles. A transit agency must also reduce diesel PM emissions of its transit fleet vehicles by 40 percent as of December 31, 2007, and 80 percent as of December 31, 2010, compared to the agency's baseline emissions as of January 1, 2005.

2. Urban Bus

An urban transit bus is a passenger-carrying vehicle powered by a heavy heavy-duty diesel engine with a load capacity of fifteen or more passengers and intended primarily for short rides and frequent stops. Urban transit buses statewide are subject to ARB's Public Transit Agency Vehicle regulation amended in 2005. The regulation required transit agencies that own, operate or lease urban buses to choose a diesel fuel or alternative fuel path and follow the requirements as described for each fuel path.

Agencies on the alternative fuel path are required to:

- Purchase or lease alternative fuel buses that meet the current standards for 85 percent of the annual purchases made by the agency, through 2015.
- Only purchase new buses with an engine certified to an optional PM standard of 0.03 g/bhp-hr or lower.
- Agencies established before January 1, 2005 that are on the alternative-fuel path shall not operate an active fleet of urban buses with:
  - Average NOx emissions in excess of 4.8 g/bhp-hr, based on the engine certification standards of the engines in the active fleet.
  - Diesel PM emission totals exceeding:
    (1) 60 percent of the agency's January 1, 2002 diesel PM average through December 31, 2006.
    (2) 40 percent of the agency's January 1, 2002 diesel PM average beginning January 1, 2007.

Agencies on the diesel fuel path are required to:

- Purchase a diesel-fueled, dual-fueled or bi-fueled bus with 2004-2006 MY engines certified to 0.5 g/bhp-hr of NOx and 0.01 g/bhp-hr of PM or an alternative fuel bus with an engine certified to an optional PM standard of 0.03 g/bhp-hr or lower.
- Agencies established before January 1, 2005 that are on the diesel fuel path shall not operate an active fleet of urban buses with:
  - Average NOx emissions in excess of 4.8 g/bhp-hr, based on the engine

certification standards of the engines in the active fleet.

- Diesel PM emission totals exceeding:

  (1) 40 percent of the agency's January 1, 2002 diesel PM average through December 31, 2006.

  (2) 15 percent of the agency's January 1, 2002 diesel PM average or equal to 0.01 g/bhp-hr times the total number of current diesel-fueled active fleet buses whichever is greater beginning January 1, 2007.

Agencies established after January 1, 2005, regardless of which path they choose, shall not operate an active fleet of urban buses with:

- Average NOx emissions in excess of 4.0 g/bhp-hr, or the NOx average of the active fleet of the transit agency from which it was formed whichever is lower, or in the case of a merger of two or more transit agencies or parts of two or more transit agencies, the average of the NOx fleet averages, whichever is lower.
- Diesel PM exhaust emissions exceeding the following values:

  (1) Through December 31, 2009, 0.05 g/bhp-hr times the total number of diesel-fueled buses in the active fleet.

  (2) As of January 1, 2010, 0.01 g/bhp-hr times the total number of diesel-fueled buses in the active fleet.

B. Solid Waste Collection Vehicles

SWCVs are on-road heavy-duty vehicles with a GVWR of 14,000 pounds or more and are used for the purpose of collecting residential and commercial solid waste. SWCV are subject to a statewide diesel PM control measure adopted by the Board on September 23, 2003 [ARB, 2004]. The regulation requires each owner to use one of the best available control technologies (BACT) as described in the regulation on each engine or collection vehicle in the fleet.

BACT, as defined by the regulation, can be summarized as an engine or power system certified to the optional 0.01 g/bhp-hr PM standard; an engine or power system certified to the 0.1 g/bhp-hr PM emission standard, used in conjunction with the highest level diesel emission control system (DECS); an alternative fuel or heavy-duty pilot ignition engine, model year 2004 – 2006 certified to the optional standard; or the highest level diesel emission control strategy that is verified.

BACT compliance deadlines are phased in, and are based on a group of engine model years as listed in Table 1.4. It is important to note that Group 2 requirements apply to specific model years (MY) based on the fleet size. Compliance deadlines begin in 2004 and continue through 2010.

Table 1.4
Implementation Schedule for Solid Waste Collection Vehicles, Model Years 1960 to 2006

Group	Engine Model Years	Percentage of Group to Use Best Available Control Technology	Compliance Deadline
1	1988 – 2002	10	December 31, 2004
		25	December 31, 2005
		50	December 31, 2006
		100	December 31, 2007
2a	1960 – 1987 (Total fleet ≥ 15 collection vehicles)	15	December 31, 2005
		40	December 31, 2006
		60	December 31, 2007
		80	December 31, 2008
		100	December 31, 2009
2b	1960 – 1987 (Total fleet < 15 collection vehicles)	25	December 31, 2007
		50	December 31, 2008
		75	December 31, 2009
		100	December 31, 2010
3	2003 – 2006 (Includes dual-fuel and bi-fuel engines)	50	December 31, 2009
		100	December 31, 2010

C. Recent and Upcoming Regulations

In addition to its existing SWCV and Transit Fleet Rules, CARB adopted an in-use diesel particulate control measure for public and utility fleets in December 2005 which impacts the project criteria for these projects. Due to low mileage, public fleet projects are generally only eligible for small grant amounts.

Private on-road heavy-duty diesel-fueled vehicle fleets such as in-use heavy-duty trucks are not currently regulated. The Board will also hear a proposed diesel particulate control measure for private fleets in 2006 which may impact the project criteria for these projects.

III. Potential Project Types

The Carl Moyer Program can achieve emission reductions from heavy-duty vehicles operating in California. The project criteria are designed to ensure that the emission reductions expected through the deployment of low-emission engines or retrofit technologies under this program are surplus, real, quantifiable, and enforceable.

There are four main types of HDV projects: new purchases, repowers, retrofit, and alternative fuels. Each of these are discussed below.

Commercially available low-emission HDVs are considered suitable Carl Moyer Program projects, either as new engine/vehicle purchases or new engine purchases for vehicle repowers. Recent statutory changes now allow for the potential to fund LHD projects. Due to the uncertainty of future requests, LHD projects will be considered initially on a case-by-case basis. If an appreciable number of applications are received for LHD projects, ARB will develop specific guidance.

A. New Vehicle Purchase

New vehicle purchases of LNG and CNG HDVs are expected to continue to be the most common type of project for on-road heavy-duty vehicles under the Carl Moyer Program, although LPG vehicles continue to be an option. The ARB certifies engines destined for sale in California and provides the engine manufacturers with an Executive Order (EO) for each certified engine family which is used to determine eligibility for new vehicle purchases and engine repowers. To be eligible, the new vehicle/engine must be certified to one of the ARB's current optional NOx emission standards of 1.8 g/bhp-hr NOx through 2006, regardless of fuel type or engine design. Beginning in January 2007, the optional standards will sunset, and projects for new vehicle/engine must be certified to 0.2 g/bhp-hr of NOx.

The Heavy-Duty Diesel-Engine and Vehicle Standard will continue to be used as the baseline for determining eligibility for on-road new purchases except urban buses. Engines and vehicles certified to the Heavy-Duty Otto-Cycle Engine Standard may also be eligible for funding if certified to a level equivalent to the current optional diesel standard or 30 percent less than the current diesel standard. Since new engines are certified throughout the year, districts are encouraged to contact ARB for the most current list of eligible engines.

Heavy-duty hybrid electric vehicle purchases are another new vehicle purchase project type eligible for Carl Moyer funding. Heavy-duty hybrid-electric propulsion systems combine two motive power sources: an energy storage system such as batteries or ultra-capacitors, and an internal combustion engine, turbine, or fuel cell functioning as an auxiliary power unit. An electric motor provides partial or complete power to the wheels. In addition, energy otherwise lost as heat during braking is captured through regenerative braking to charge the energy storage system.

In order to qualify for the Carl Moyer Program, the hybrid-electric drive system must be certified using the "California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes." These test procedures provide a method to quantify the emission benefits of a hybrid-

electric drive system which is not possible through engine certification methods. At this time, one gasoline hybrid-electric drive system for use in urban buses is certified to the optional NOx standards at 0.6 g/bhp-hr and is classified as an alternative fuel bus.

Average Banking and Trading (ABT) engines (i.e., all Family Emission Limit (FEL)-certified engines) are not eligible to participate in the Carl Moyer Program for new vehicle purchase projects since emission benefits from an engine certified to an FEL level are not surplus emissions.

B. Repower

Vehicle repower refers to the replacement of an existing engine with a newer engine certified to lower emission standards. For the Carl Moyer Program, existing HDV engines, regardless of model year, must be repowered with an CARB certified engine, Model Year 1991 or newer. Engine repowers are allowed by AQMD only for projects that are using alternative fuel replacement engines. In addition, repowers are allowed only when the highest available CARB verified retrofit is installed as part of the repower project (If no verified retrofit is available, then this requirement is waived). All other eligibility criteria must also be met. Under the Carl Moyer Program, funding is not available for projects in which spark-ignition engines (i.e., natural gas or gasoline, etc.) are replaced with new diesel engines. No Diesel-to-diesel engine repowers are allowed in the on-road category.

Another possible repower option is the use of an engine that was certified to a FEL level as the replacement engine. FEL engines can be funded for vehicle repower projects only if they are certified to a level that is below the required emission standard. Due to the possibility of emission credits being generated from FEL engine averaging, specific guidelines must be followed when calculating emission reductions. These Guidelines are explained in the repower portion of the Project Criteria section below.

C. Retrofit

Retrofit involves modifications to an engine and/or fuel system such that the retrofitted engine does not have the same specifications as the original engine. Retrofit projects are allowed by AQMD for all engine model years, regardless of mechanical or electronic control. The most straightforward retrofit projects involve add-on aftertreatment. ARB has approved formal verification procedures for several retrofit kits and diesel emission control strategies (DECS). The verification process is ongoing, and applicants are encouraged to contact ARB to obtain the most current list of eligible retrofits. Retrofits may also include engine and/or fuel system component upgrades that could be done at the time of an engine rebuild, resulting in a lower emission configuration. The cost of the retrofit, and all filters needed during the project life, may be paid for with Carl Moyer Program funding provided it meets the weighted cost-effectiveness limit.

See Part IV, Appendix F of CARB's CMP Guidelines for more detailed information regarding retrofits. DECS retrofit projects are the only diesel on-road projects eligible in the AQMD Moyer Program. Table 1.5 provides the verification classifications for diesel emission control strategies.

Table 1.5 Verification Classifications for Diesel Emission Control Strategies

Pollutant	Reduction	Classification
PM	< 25%	Not verified
	≥ 25%	Level 1
	≥ 50%	Level 2
	≥ 85%, or ≤ 0.01 g/bhp-hr	Level 3

Only designated engine families for specified model years are compatible with CARB-verified diesel exhaust after-treatment devices. CARB certification levels and information are continually being updated. Applicants are required to provide engine family numbers and submit verification letters as part of the application. Verification letters as well as current information can be found at www.arb.ca.gov/diesel/verdev/verdev.htm.

IV. Project Criteria

Reduced-emission on-road heavy-duty vehicle projects which include new vehicle purchase, vehicle engine replacement (repower), and engine retrofit, can be considered for incentive funding. The project criteria listed below for on-road heavy-duty vehicles provide districts, fleet operators, transit agencies, and applicants with the minimum qualifications for the Carl Moyer Program. The primary criteria for selection are: emission reductions, cost-effectiveness, and ability for the project to be completed within the timeframe of the program. Sample calculations that illustrate the methodology for determining emission reductions and cost-effectiveness are included in Appendices C and D of Part IV of CARB's 2005 Guidelines. These may be downloaded from: http://www.arb.ca.gov/msprog/moyer/guidelines/revisions05.htm

A. General

- Emission reductions obtained through Carl Moyer Program projects must not be required by any federal, state or local regulation, memorandum of agreement/understanding with a regulatory agency, settlement agreement, mitigation requirement, or other legal mandate.
- Projects must meet a cost-effectiveness of $14,300 per weighed ton (NOx + ROG + (20*PM10)) reduced calculated in accordance with CARB's cost-effectiveness methodology.
- No emission reductions generated by the Carl Moyer Program shall be used as

marketable emission reduction credits, or to offset any emission reduction obligation of any person or entity.

- No project funded by the Carl Moyer Program shall be used for credit under any federal or state emission averaging banking and trading program.
- Projects must have a minimum project life of three years. ARB may approve a shorter project life on a case-by-case basis. Projects with shorter lives may be subject to additional funding restrictions, such as a lower cost-effectiveness limit or a project cost cap.
- The contract term must extend to the end of the project life.
- Funded projects must have at least 75 percent of the vehicle's annual miles traveled or gallons consumed within the South Coast Air Basin.
- Potential projects that fall outside of these criteria may be considered on a case-by-case basis if evidence provided to the AQMD suggests potential surplus, real, quantifiable and enforceable emission reduction benefits.
- Vehicles operating under a compliance extension granted by the ARB, a local district, or the U.S. EPA are not eligible for funding.
- Maximum project life for on-road projects are as follows:

School buses > 33,000 GVWR -New	20 years
Buses > 33,000 GVWR -New	12 years
Other On-road -New	10 years
Repowers with Retrofits	5 years
Retrofits	5 years

Applicants must provide documentation to justify a longer project life. The default project life does not consider upcoming regulatory requirements. A shorter project life may be shorter due to regulatory requirements.

- On-road heavy-duty diesel vehicles with a gross vehicle weight rating between 8,501 and 14,000 pounds may be considered for Carl Moyer Program funding for new, repower and retrofit projects on a case-by-case basis.
- All engines in new purchases and repower projects must be certified by the ARB for sale in California and must comply with durability and warranty requirements.
- All aftermarket emission controls (retrofits) must be verified by ARB.

B. Violation Compliance Check

CARB requires a violation compliance check for all repower and retrofit projects. For these projects, the applicant must submit information regarding the project to AQMD to check for outstanding violations. The process for completing the compliance check is as follows:

- The AQMD shall email their ARB district liaison the contact name, organization or business name and vehicle identification number for the project. This

information is provided to the AQMD from the applicant in accordance with Application Attachment 1, Part One.

- The liaison will forward that information electronically to the responsible parties at ARB. The liaison will email the district the results of the compliance check within seven working days.
- If the compliance check indicates there is an outstanding violation the district shall inform the engine owner in writing that no disbursement may be made until the owner provides proof that the violation has been corrected and the fines have been paid.
- If the outstanding violation is based on problems with the baseline engine (e.g., gross polluter) the new engine must be installed (instead of fixing the old engine), the vehicle must be operational, the engine owner must pay the violation and submit documentation of the violation being corrected with, or before submitting, the invoice.
- During inspections, districts must also check for a sticker verifying engines subject to the software upgrades for diesel trucks (i.e., chip reflash) have completed the upgrade before receiving funding.

C. New Purchase

The following criteria apply to all on-road new vehicle purchases

- Projects must provide at least a 30 percent NOx emission reduction compared to baseline NOx emission factors for the specific vehicle type. Exceptions may be considered by CARB on a case-by-case basis.
- Fleets/agencies affected by upcoming fleet regulations may use Carl Moyer Program funding to purchase a new vehicle if the project life expires prior to the final compliance date for the reductions in the regulation. For example, if a project with a 3-year project life is funded in December 2006, the emission reductions must be surplus to any emission reductions that are required by any regulations that apply through December 2009.
- Fleets/agencies purchasing vehicles that will be affected by upcoming emission standards may use Carl Moyer funding to purchase a new vehicle up to the compliance date of the new standard.
- The Heavy-Duty Diesel-Engine and Vehicle Standard will be used as the baseline for determining eligibility for on-road new purchases. Engines and vehicles certified to the Heavy-Duty Otto-Cycle Engine Standard may be eligible if certified to a level equivalent to the current optional diesel standard or 30 percent less than the current diesel standard.
- Through 2006, new vehicles eligible for the Carl Moyer Program must have engines certified to an optional, low-emission standard of 1.8 g/bhp-hr NOx + NMHC or less.
- From 2007 to 2009, new vehicle engines eligible for the Carl Moyer Program must be certified to a 0.2 g/bhp-hr NOx emission limit.

- Engines used in any ABT program are not eligible for funding in the NEW vehicle project category.

D. Repower

The following criteria apply to all on-road repower (engine replacement) projects.

- Repower replacement engines must be an ARB certified alternative fueled engine with a Model Year of 1991 or newer.
- On-road engine repowers are allowed only when the highest available ARB retrofit is installed as part of the repower project. Check the CARB DECS verification website for
- If a repower project does not meet the weighted cost-effective limit due to a retrofit, then the project is only eligible for the cost up to the weighted cost-effective limit.
- If no retrofit is shown to be technically feasible to the district and ARB, the retrofit is not required.
- Repower projects that reduce NOx emissions must be certified by ARB to a NOx reduction level of at least 15 percent from the baseline engine.
- Fleets/agencies affected by upcoming fleet regulations may use Carl Moyer funding for repower projects if the project life expires prior to the final compliance date for the reductions in the regulation. For example, if a project with a 3-year project life is funded in December 2006, the emission reductions must be surplus to any emission reductions that are required by any regulations that apply through December 2009.
- Funding requests for other related repowering equipment, such as the vehicle transmission, will be considered on a case-by-case basis, based upon whether it is a necessary expense, and is at the discretion of the district.
- The full cost of a retrofit kit included in a repower project may be funded subject to the $14,300 weighted cost-effectiveness limit.
- The replacement engine used in vehicle repower projects may be a new, rebuilt, or remanufactured engine. Eligible rebuilt or remanufactured engines are those offered by the original engine manufacturer (OEM) or by a non-OEM rebuilder who demonstrates to the ARB that the rebuilt engine and parts are functionally equivalent from an emissions and durability standpoint to the OEM engine and components being replaced. Rebuild and remanufactured engines that are not re-certified to new emission standards, shall use the emission standards associated with the original engine block.
- For repowers, replacement engines manufactured after September 30, 2002, that are not certified to at least the 2.4 g/bhp-hr NOx + NMHC, or 2.5 g/bhp-hr NOx + NMHC with a 0.5 g/bhp-hr NMHC cap, are ineligible to participate in the Carl Moyer Program.
- Engines that are certified to a FEL NOx or NOx + NMHC level that is lower than the required emission standard are eligible for use in vehicle repower projects.

However, the emission level that can be used in cost-effectiveness calculations for these engines would be the applicable emission standards and not the FEL levels.

E. Retrofit

The following criteria apply to all on-road retrofit projects:

- Only ARB-verified retrofits are eligible for funding.
- Retrofit projects that reduce NOx emissions must be verified by ARB to a NOx reduction level of at least 15 percent from the baseline engine.
- Retrofit projects that control PM must use the highest level cost-effective technology available for the equipment being retrofitted. The following are the diesel PM reductions for each ARB verified level: Level 1 (25 percent reduction), Level 2 (50 percent reduction), or Level 3 (85 percent reduction).
- Fleets/agencies affected by upcoming fleet regulations may use Carl Moyer funding for retrofit projects if the project life expires prior to the final compliance date for the reductions in the regulation. For example, if a project with a 3-year project life is funded in December 2006, the emission reductions must be surplus to any emission reductions that are required by any regulations that apply through December 2009.
- If the retrofit device reduces both NOx and PM emissions and is being installed to comply with a PM requirement, only the cost of the NOx reductions are eligible for Carl Moyer Program funding.
- The cost of the retrofit, and all filters needed during the project life, may be paid for with Carl Moyer Program funding provided it meets the weighted cost-effectiveness limit.

F. Scrap

For repowers, the existing (old) engine must be destroyed and rendered useless. There must be no cannibalization of parts from the old engine. Engines must have a complete and fully visible and legible engine serial number in order to be eligible for an engine repower. The destruction of the engine must be documented by the district seeing the destroyed engine or the receipt from the qualified vehicle salvage yard (see appendix for definition*)*. Engines without a visible and legible serial number may be repowered if district staff stamps the engine block with the Moyer Program project number and the district staff is present to personally verify engine removal from the project vehicle or equipment and the subsequent engine destruction. CARB will consider alternatives to stamping the engine block on a district-by-district basis.

G. Fuel

- Carl Moyer funds can not be used for fuel projects.

H. Glider Kits

- An engine repower for a glider kit (replacement cab and chassis) is eligible for funding. The replacement engine must be newer than the glider kit and meet the general program criteria above.
- Glider kits themselves are not an eligible expense under the Carl Moyer Program.

I. Heavy-Duty Trucks

Currently, most in-use heavy-duty trucks, or heavy-duty vehicles designed to carry an entire load such as long-haul, short-haul, delivery, and construction trucks, are not subject to any fleet rules. The ARB is developing a fleet rule for private heavy-duty vehicles that is tentatively scheduled to be presented to the Board in 2006. If approved, it may affect the project criteria for these projects. Eligible heavy-duty truck projects including new vehicle purchases, repowers, and retrofits are subject to the general criteria cited above.

- Heavy-duty trucks are eligible for funding if they meet the general program criteria above.
- Hybrid electric vehicle (HEV) new purchases will be considered on a case-by-case basis if the HEV is certified to the current NOx and PM standards.

J. Private Fleets

Private on-road heavy-duty diesel vehicle fleets are not currently regulated by a fleet regulation. The Board is tentatively scheduled to consider a proposed diesel particulate control measure for these fleets in 2006 which may affect the project criteria for these projects.

- Private fleet vehicles are eligible for funding if they meet the general program criteria above.

K. Public and Utility Fleets

Municipal and utility-owned on-road heavy-duty diesel-fueled vehicles are now regulated by CARB's Public and Utility Fleet regulation. The diesel particulate control measure for these fleets was adopted in December 2005 and will affect the project criteria for these projects. Note that due to low mileage, public fleet projects are generally only eligible for small grant amounts. The affect of the new fleet rules on these projects is still being evaluated by agency staff. As such, all public and utility fleet projects will be considered on a case-by-case basis.

L. School Buses

School buses are vehicles used for the express purpose of transporting students through grade 12 from home to school, school to home and to any school sponsored activities.

- School buses are eligible for Carl Moyer Program funding if they meet the general program criteria above; however, their relatively low annual miles traveled usually allows for minimum grant amounts.

M. Solid Waste Collection Vehicles

SWCVs are on-road heavy-duty vehicles with a GVWR of 14,000 pounds or more that are used for the purpose of collecting residential and commercial solid waste. SWCVs are subject to a statewide in-use diesel particulate matter airborne toxic control measure (ATCM). Projects that meet the following criteria provide emission reductions that are surplus to the regulatory requirements and may be funded:

- Projects are subject to the general program criteria listed above.
- Projects will be considered on a case-by-case basis. All SWCV projects must submit evidence of compliance with the SWCV rule or documentation to show that the funds will not be used to meet the rule's requirements. Documentation must include the name of the company, address, and fleet terminal(s) names and locations. Documentation must also include company records identifying the vehicles in their total fleet including: listing them by the terminals out of which they operate, model years of vehicles and engines in the fleet, vehicle identification number, serial numbers, engine families, series, status as active or backup vehicle. The companies must also identify out of which terminal the vehicles potentially receiving Carl Moyer Program funds operate. (See part two of Attachment 1 of the application for this request).
- New purchase, repower, and retrofit projects for group 2a (MY 1960-1987 with a total fleet of > 15 collection vehicles) are eligible for funding through December 31, 2006 if the following are met:
    - 100 percent of the vehicles in group 2a must be in compliance with the SWCV ATCM and in operation by December 31, 2006.
    - 25 percent of the vehicles in group 2a would be eligible for the incremental cost of the new purchase, repower or retrofit project up to the weighted cost-effectiveness limit.
    - The maximum project life for these projects is three years.
- New purchase, repower, and retrofit projects for group 2b (MY 1960-1987 with a total fleet of < 15 collection vehicles) are eligible for funding through December 31, 2007 if one of the following options are met:
    - If 100 percent of the vehicles in group 2b are in compliance with the SWCV ATCM and in operation by December 31, 2006, 50 percent of the vehicles in group 2b would be eligible for the incremental cost of the new purchase, repower or retrofit project up to the weighted cost-effectiveness limit. The project life for 25 percent of the vehicles is three years and the remaining 25 percent is four years.
    - If 100 percent of the vehicles in group 2b are in compliance with the SWCV ATCM and in operation by December 31, 2007, 25 percent of the vehicles in group 2b would be eligible for the incremental cost of the new purchase, repower or retrofit project up to the weighted cost-effectiveness limit. The project life for these vehicles is three years.

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- New purchase, repower, and retrofit projects for group 3 (MY 2003-2006) are eligible for funding through December 31, 2007 if one of the following options are met: − If 100 percent of the vehicles in group 3 are in compliance with the SWCV ATCM and in operation by December 31, 2006, 100 percent of the vehicles in group 3 would be eligible for the incremental cost of the new purchase, repower or retrofit project up to the weighted cost-effectiveness limit. The project life for 50 percent of the vehicles is three years and the remaining 50 percent is four years.
    - If 100 percent of the vehicles in group 3 are in compliance with the SWCV ATCM and in operation by December 31, 2007, 50 percent of the vehicles in group 3 would be eligible for the incremental cost of the new purchase, repower or retrofit project up to the weighted cost-effectiveness limit. The project life for these vehicles is three years.
- During 2007-2009, new vehicle purchases throughout the state must meet the new vehicle purchase requirements above and must be certified to 0.2 g/bhp-hr for NOx.
- Surplus NOx reductions from retrofit projects are eligible for funding as described in the retrofit criteria above.

N. Street Sweepers and Other Stop-and-Go Vehicles

Stop-and-go vehicles, such as street sweepers, operated in a public fleet are subject to CARB's Public and Utility Fleet Rule. See section K above for additional discussion. Street sweeper and other stop-and-go vehicle projects that are surplus to regulations are eligible for funding for new purchase, repower, and retrofit projects.

O. Transit Fleet Vehicles (Non-Urban Buses and Transit Vehicles)

Transit fleets include commuter service buses and or transit fleet vehicles that are not urban buses. These fleets are subject to a statewide in-use fleet rule that impacts vehicles with a GVWR of 8,501 pounds or greater and are powered by a heavy-duty engine fueled by diesel or alternative fuel that are owned or operated by a transit agency.

- Projects are subject to the general program criteria listed above.
- Projects will be considered on a case-by-case basis. All project applicants must submit evidence of compliance with the Transit Fleet Rule or documentation to show that the funds will not be used to meet the rule's requirements. Documentation must include the transit agency's Transportation Implementation Plan and annual ARB updates. If data included in the Transportation Implementation Plan is not sufficient, districts and/or ARB may require additional documentation.
- Through 2006, new vehicle purchases by transit agencies are eligible for Carl Moyer Program funding if the engine is certified to the optional standard of 1.8

g/bhp-hr NOx + NMHC.

- From 2007 to 2009, new vehicle purchases must be certified to 0.2 g/bhp-hr NOx to be eligible for Carl Moyer Program funding.
- Transit agency fleets established before January 1, 2007 are eligible for Carl Moyer Program funds for repower and retrofit projects if documentation is provided that shows:
    1. The whole fleet has met the 2.4 g/bhp-hr NOx fleet average, and
    2. PM reductions of 80 percent compared to January 1, 2005 PM levels or equal to 0.01 g/bhp-hr times the total number of transit fleet vehicles in the current fleet whichever is greater.
- Transit agency fleets established after January 1, 2007 are eligible for Carl Moyer Program funds for repower and retrofit projects through December 31, 2007 if documentation is provided that shows:
    1. The whole fleet has met the 2.4 g/bhp-hr NOx fleet average, and
    2. PM reductions of 50 percent compared to the fleet's baseline when established.
- Transit agency fleets established after January 1, 2007 are eligible for Carl Moyer Program funds for repower and retrofit projects beginning January 1, 2008 if documentation is provided that shows:
    1. The whole fleet has met the 2.4 g/bhp-hr NOx fleet average, and
    2. PM reductions of 80 percent compared to the fleet's baseline when established.

P. Urban Transit Buses

An urban transit bus is a passenger-carrying vehicle powered by a heavy heavy-duty diesel engine with a load capacity of fifteen or more passengers and intended primarily for intra-city operation, short rides and frequent stops. Urban transit buses statewide are subject to an in-use and new purchase regulation that requires transit agencies that own, operate or lease urban buses to choose a diesel-fuel or alternative-fuel path and follow the requirements as described for each fuel path.

- Projects are subject to the general program criteria listed above.
- Projects will be considered on a case-by-case basis. All urban bus projects must submit evidence of compliance with the Public Transit Agency Vehicle Rule or documentation to show that the funds will not be used to meet the rule's requirements. Documentation must include the transit agency's Transportation Implementation Plan and annual ARB updates. If data included in the Transportation Implementation Plan is not sufficient, district and/or ARB may require additional documentation.
- For urban bus new vehicle projects, only the portion not funded by the Federal Transit Administration (FTA) is eligible for Carl Moyer Program funding. Proper documentation must be provided. The full incremental cost for an urban transit

bus that is not funded by FTA may be granted under the Carl Moyer Program. Operation and maintenance costs are not eligible for Carl Moyer Program funding.

- Through 2006, alternative fuel buses are eligible for Carl Moyer Program funds for new bus purchases if the engine is certified to at least the optional standard of 1.8 g/bhp-hr for NOx + NMHC.
- Through 2006, diesel fuel buses are eligible for Carl Moyer Program funds for new bus purchases if the engine is certified to 0.2 g/bhp-hr for NOx.
- Urban bus fleets established before January 1, 2005 that are on the diesel fuel-path are eligible for Carl Moyer Program funds for repower and retrofit projects if documentation is provided that shows:
    1. The whole fleet has met the 4.8 g/bhp-hr NOx average, and
    2. PM reductions of 85 percent compared to January 1, 2002 PM levels or equal to 0.01 g/bhp-hr times the total number of current diesel-fueled active fleet buses whichever is greater.
- Urban bus fleets established before January 1, 2005 that are on the alternative fuel-path are eligible for Carl Moyer Program funds for repower and retrofit projects if documentation is provided that shows:
    1. The whole fleet has met the 4.8 g/bhp-hr NOx average, and
    2. PM reductions of 60 percent compared to January 1, 2002 PM levels.
- Urban bus fleets established after January 1, 2005 are eligible for Carl Moyer Program funds for repower and retrofit projects if documentation is provided that shows:
    1. The whole fleet has met the 4.0 g/bhp-hr NOx average, and
    2. May not have a diesel PM emission total exceeding 0.01 g/bhp-hr (exhaust emission value) times the total number of diesel-fueled buses in the active fleet.
- Hybrid electric bus (HEB) new purchases will be considered on a case-by-case basis, if the HEB is certified to the current NOx and PM standards.

V. Cost-Effectiveness Calculations

To receive Carl Moyer Program funding, each project must meet the maximum cost-effectiveness threshold of $14,300 per weighted ton of covered pollutants reduced. Only funds provided by the Carl Moyer Program and local district matching funds are to be used in determining cost-effectiveness.

The emission factors in the tables of CARB CMP Guidelines, Part IV, Appendix B reflect preliminary data developed by ARB staff as part of a comprehensive effort to update the emissions models used for on-road motor vehicles and off-road mobile sources. These draft data were made available on ARB's website in early 2005, but are subject to change as staff completes its analyses and the associated model development. Appropriate emission factors as a function of vehicle type and model year are illustrated

in Appendix B. ARB staff will issue Carl Moyer Program Advisories to update the tables as necessary.

The converted emission standards used in the calculations are the standards described in the emission standard section of this chapter that have been adjusted using the fuel correction factors and NOx fraction factors in Appendix B. It is important to note that urban buses have different standards than other heavy-duty vehicles.

Examples

On-road project calculations are generally mileage based. However, some projects such as stop-and-go vehicles can use fuel-based calculations.

For new purchase projects, the baseline will be an engine certified to the current standard. The reduced technology will be an engine certified to the current optional standard or 30 percent less than the current standard. For repower projects, the baseline will be the model year of the existing engine that would have been rebuilt. The reduced technology will be the engine certified to at least 5.0 g/bhp-hr of NOx that will be installed instead of the rebuilt engine. The baseline for a retrofit project is the existing engine. The reduced technology is the verified level of emission reductions for the retrofit.

A detailed description of cost-effectiveness calculations can be found in Part IV, Appendices C and D of CARB's CMP Guidelines, which may be downloaded at http://www.arb.ca.gov/msprog/moyer/guidelines/revisions05.htm